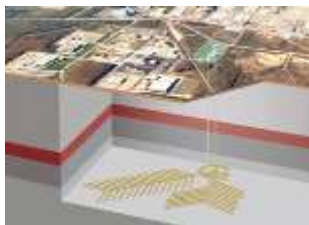


Nuclear Waste Repository Proposed for the Eastern Shore of Lake Huron

Ontario Power Generation's Deep Geological Repository for Low and Intermediate Level Radioactive Waste

Overview

Ontario Power Generation (OPG) is proposing to construct and operate a deep geologic disposal facility at the Bruce Nuclear site, within the Municipality of Kincardine, Ontario. Low and intermediate level radioactive wastes produced from the continued operations of the nuclear generating stations at Bruce, Pickering and Darlington would be placed in the Deep Geological Repository (DGR) at an estimated depth of 680 metres below the surface, approximately 650 metres from the eastern shore of Lake Huron. The estimated size of the surface facilities for the DGR is approximately 15 hectares while the footprint of the underground facilities is approximately 30 hectares.



The underground repository, as proposed, will consist of a set of access shafts and a series of tunnels and rooms in which the waste would be placed in the containers they were shipped or previously stored in.

Low level waste consists of industrial items that have become contaminated with low levels of radioactivity during routine clean-up and maintenance activities at nuclear generating stations. Intermediate level radioactive waste consists primarily of used nuclear reactor components, ion-exchange resins and filters used in reactor water filtration systems. The wastes are generated during the operation of nuclear reactors in Ontario, and during refurbishment of the reactors (replacement of the reactor's inner components). Shortly before a federal review hearing got underway in September 2013 OPG acknowledged that it also intended to place decommissioning wastes in the proposed DGR, a decision that would double the volume of the waste from 200,000 m³ to 400,000m³. Ontario Power Generation has made a commitment to the host municipality of Kincardine that the Deep Geologic Repository will not be used to store high level nuclear fuel waste. Kincardine and other area municipalities have signed a "willing host" agreement with Ontario Power Generation which sets out a number of conditions, including payments from Ontario Power Generation to the municipalities which are dependent on statements of support for the project from the municipalities.

Key Issues

Some of the key issues related to this proposal to bury nuclear waste in a limestone rock formation on the shore of Lake Huron include the eventual failure of the waste containers, the questionable ability of the "host" limestone and shale rock formations to act as a barrier to radioactive wastes migrating from the repository, the effectiveness of the seals to be placed in the shafts at time of closure, the rate of gas generation in the repository, the volume and nature of the radioactive wastes, the close proximity to Lake Huron, and local opposition.

There are several additional issues that apply to this and to other proposals to bury nuclear waste, more generally, including the effectiveness of both the engineered and geological barriers, the reliability of the computer modeling on which predictions of safety are based, and a general lack of independent peer reviewed studies.

Review Process

A joint federal review began in 2006. A Joint Review Panel was appointed in January 2012 and a public review of the proposal was announced February 3, 2012. A public hearing commenced in September 2013, was adjourned in October 2013 and reconvened in September 2014 and the Joint Review Panel announced a deadline for final comments of October 9 2014 and closed the public record in November 2014. In a letter dated November 18, 2014 the Joint Review Panel informed the Federal Minister of the Environment that they would be providing a report with their findings and recommendations by May 6, 2015.

Deep Geological Repositories

Internationally, the nuclear industry has been promoting the idea of burying nuclear waste for decades. The nuclear industry's argument in favour of burying nuclear waste relies on concept of "multiple barriers", and the theory that a combination of barriers – generally a combination of packaging, packing material and rock - will contain the radioactivity for long enough to allow the radioactivity of the waste to decrease considerably. Key issues relate to the ability of the various barriers – both engineered containers and the rock formation – to effectively contain the wastes and the reliability of the computer-based predictions that the nuclear industry will use to defend its proposal. Repairing containers or retrieving failed containers of radioactive material will be difficult after the containers are placed in the underground repository, and these difficulties will increase over time and will dramatically increase if and when the waste containers begin to fail. Even low levels of exposure to radioactivity – including from wastes - can be harmful.

Backgrounder on Ontario Power Generation's Deep Geological Repository for Low and Intermediate Level Radioactive Waste Context

The Bruce Nuclear Generating Station is a 923 hectare nuclear complex located within the Municipality of Kincardine, on the eastern shore of Lake Huron. With its fleet of eight nuclear reactors, it is the largest nuclear facility in North America in terms of potential output and the second largest nuclear facility in the world; the total output of 6,232 MW (net) and 7,276 MW (gross) when all units are online. Current output with 6 of the 8 reactors operating is 4,640 MW. Two 500 kV transmission lines going out to feed the major load centres in southern Ontario, in addition to three 230 kV lines for more local service. The nuclear complex includes the Bruce Nuclear Generating Station with Bruce A and B each consisting of 4 reactors, the Western Waste Management Facility, an additional Radioactive Waste Storage Area, Heavy Water Plants A and B which are currently being decommissioned, and the Douglas Point Reactor which was shut down in 1984.

In June 2000, OPG entered into a long term lease agreement with private sector consortium Bruce Power to take over operation of the Bruce station. In May 2001, Bruce Power began operations. Ontario Power Generation remains responsible for the nuclear legacies, including the out-of-service Douglas Point Reactor, the heavy water plants, and all of the waste and waste facilities. The Western Waste Management Facility, owned and operated by Ontario Power Generation (OPG) and located on OPG retained lands and located within the boundary of the overall Bruce Power site, was developed in stages since 1974 to accommodate waste produced during reactor operation and maintenance and it receives and manages shipments of low and intermediate level radioactive waste from the Bruce, Pickering and Darlington nuclear power stations. Beginning in 2003 used fuel waste from Bruce has also been stored in the Used Fuel Dry Storage Facility located adjacent to the WWMF.

Proposed Deep Geologic Repository

Ontario Power Generation is proposing a deep-geologic disposal facility to manage low-level and intermediate level radioactive wastes at the Bruce site. The waste would consist of industrial items and used nuclear components (but not used fuel) which is currently processed and stored at OPG's WWMF after being transported by truck from Pickering and Darlington to the WWMF, and by truck on-site from the Bruce reactor stations. The DGR will receive low and intermediate level radioactive waste (L&ILW) currently in storage on the Bruce site interim facilities at the Western Waste Management (WWMF) as well as that produced from the continued operation of generating stations at Bruce, Pickering and Darlington, Ontario.

DGR Wastes

The estimated volume of low and intermediate level waste to be placed in the DGR, excluding decommissioning waste is 200,000 cubic metres (2010). As of 2011, OPG had approximately 84,000 m³ of low and intermediate level waste in storage at the WWMF (2011) and estimated that between 4,000 and 6,000 m³ of L&ILW would be received each year for processing and packaging prior to emplacement in the DGR. Following incineration or compaction, the amount of waste requiring emplacement in the DGR is expected to be approximately 3000 m³ per year.

Wastes currently received at the WWMF are classified as Type 1, Type 2 or Type 3, depending on the contact dose rate; Type 1 wastes have the lowest radiation levels and Type 3 the highest. The majority of wastes received and to be emplaced in the DGR, by volume, are Type 1 low level waste. The majority of the radioactivity is contained in the smaller volume of Type 3 intermediate level waste

Intermediate level waste (ILW) consists primarily of used nuclear reactor components, and the ion-exchange (IX) resins and filters used to purify reactor water systems. The wastes require shielding during handling due to their higher levels of radioactivity. Radionuclides of particular interest in ILW include carbon-14 in the ion exchange resins, and nickel-59 and nickel-63 on the irradiated core components, as well as quantities of longer-lived radionuclides such as iodine-129, chlorine-36, and technetium-99.

In August 2013 OPG confirmed that they also intend to place decommissioning wastes in the DGR. Adding decommissioning wastes doubles the volume of wastes, increases risks associated with gas generation in the repository as a result of a higher metal content in decommissioning wastes (in comparison to operation and refurbishment wastes). Decommissioning wastes are also more radioactive.

Learn more about the proposed repository and actions you can take by visiting www.bruce-nuclear-waste-burial.ca.

Visit www.stopthegreatlakesnucleardump.com to take action on the proposed DGR by signing a petition or contacting your elected officials and urging them to pass a resolution opposing the proposed nuclear waste repository.